GEST

GODDARD EARTH SCIENCES AND TECHNOLOGY CENTER

Quarterly Report
Cooperative Agreement NCC5-494
Reporting Period: October 1, 2001 through December 31, 2001

Goddard Earth Sciences and Technology Center
University of Maryland, Baltimore County
1000 Hilltop Circle
Baltimore, MD 21250

UMBC

UNIVERSITY OF MARYLAND BALTIMORE COUNTY

GEST

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Northrop-Grumman Corporation

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Technical Status Report

The following is a technical report of the progress made under Cooperative Agreement NCC5-494, the Goddard Earth Sciences and Technology Center (GEST). The period covered by this report is October 1, 2001 through December 31, 2001.

GEST is a consortium of scientists and engineers, led by the University of Maryland, Baltimore County (UMBC), to conduct scientific research in Earth and information sciences and related technologies in collaboration with the NASA Goddard Space Flight Center (GSFC). GEST was established through a cooperative agreement signed May 11, 2000, following a competitive procurement process initiated by GSFC.

Overview of significant Activities

GEST Administrative Staff

Three positions were added to the GEST administrative staff during this reporting period (Administrative Assistant II (2) and Associate Director (1)). One Administrative Assistant will be located at the GEST/NASA office and the other will be located in the GEST/UMBC office. The names, locations and telephone numbers of the current GEST administrative staff members are given in Appendix T-1 following this technical report.

GEST Technical Staff

GEST Architecture and Faculty Research Structure consists of a GEST Council instituted this reporting period. Within the GEST Council are five Faculty Research Spokespersons. The members of the GEST Council are noted in Table T-1 below. The first GEST Council meeting was held on December 18, 2001.

The research faculty and staff of GEST are assigned to one of five "Research Groups" (RG):

— Land Surface and Hydrology
— Seasonal and Interannual Prediction
— Aerosols and Clouds
— Climate and Trace Species
— Information Science and Technology

A RG spokesperson is appointed from among the members of each of these groups. In addition to his or her research responsibilities, the RG spokesperson serves as an administrative interface between the group and the Director. The RG spokespersons may also serve as contact points for GSFC civil servant managers in discussions concerning collaboration in the scientific areas of their groups. The research group structure puts an intermediate level of 'management' in place which is able to assist the Director in administrative, scientific, and collaborative issues. Within these groups, faculty can discuss problems and status of their work, share ideas concerning

scientific issues, and further opportunities for collaboration with GSFC, GEST, and the external community of academic and government organizations.

We expect the RGs to help develop a proactive and stimulating atmosphere of innovative research. The Groups will organize conferences and workshops in their areas of interest, recommend that GEST host or participate in society meetings, take responsibility for special journal issues, and engage in other such activities that will enhance the prominence of the GEST/GSFC collaboration as a powerful force in Earth sciences research.

Research Group Spokesperson Functions

1. The RG spokesperson will convene periodic meetings of his or her group and institute communication procedures designed to foster flow of information among members, and to inform them of notices and actions from GEST and GSFC upper management.

2. The GEST Director has formed a "GEST Council", which will consist of the Director, Associate Director, Assistant Director, Chief Scientist, and the RG spokespersons, and has instituted a schedule of monthly meetings. The objectives will be to maintain good communication between Faculty and Administration, to resolve administrative problems, to discuss evolving scientific issues and funding opportunities, and to promote the scientific status of GEST.

3. Each RG Spokesperson will work with the GEST Director, Associate Director, and Chief Scientist, as well as with relevant GSFC managers, to maintain an awareness of forthcoming research possibilities in the broad areas covered by his or her RG. This includes announcements for funding opportunities and forthcoming scientific meetings (workshops and conferences).

4. RG Spokespersons will ensure a close collaboration between the civil servants and GEST management, helping to resolve problems and improve the productivity of the collaborative venture, for example by considering new joint co-investigator proposals.

5. RG Spokespersons will encourage journal publications and meeting presentations. He or she will help to evaluate manuscripts intended for publication.

6. The RG Spokespersons will work with GEST management to coordinate and produce the various reports required by the GEST Cooperative agreement. These include the Annual Report and the Annual Research Program Plan.

Table T-1 GEST Council Members

Name	Position	Code	Section
Robert Curran	Director	900	Administration
Vacant	Associate Director	900	"
L. Anathea Brooks	Assistant Director	900	"
Henry Plotkin	Chief Scientist	900	"
Dr. Julio Bacmeister	Research Group Spokesperson	971	Seasonal and Interannual Prediction
Dr. Susan Hoban	Research Group Spokesperson	103	Information Science and Technology
Dr. Steven Pawson	Research Group Spokesperson	910	Climate and Trace Species
Dr. Susan Sakimoto	Research Group Spokesperson	921	Land Surface and Hydrology
Dr. Alexander Smirnov	Research Group Spokesperson	923	Aerosols and Clouds

Position advertisements appeared in *EOS, Transactions of the American Geophysical Union* and the *American Astronomical Society, Position Opportunities (web page).* Information concerning these advertisements is provided in Table T.2.

Table T.2. Position advertisements published during this reporting period

Advertisement	No. of Positions	Publication Date	Closing Date
EOS – XIII	2	10/9	10/24
EOS – XIV	1	10/16	10/31
Am. Astro. Soc.	2	9/24	10/24
EOS Second XII	6 (4 repeats)	11/12	11/30
EOS Fellow	1	11/30	1/18
Chronicle Of Higher Ed. Fellow	1	11/30	1/18
EOS Rancic GRA	1	12/4	
EOS Assoc. Director	1	12/4	12/31
Chronicle of Higher Ed. Assoc. Director	1	11/23	Open

Changes in the GEST technical staff during this reporting period are provided in the following two tables, Table T.3 and Table T.4.

Table T.3. GEST technical staff hired during the reporting period

Name	Sponsor	Code
Jean Paul Boy	B. Chao	926
David Lary	R. Rood	910
Shuhua Li	R. Rood	910
Gupta, Mohan	S. Kawa	916
Pap, Judit	J. Pap	916
Riedi, Jerome	M. King	900
Yeh, Kevin	C. Lin	910

Table T.4. GEST technical staff who have left during the present reporting period

Name	Sponsor	Code
Guillevic, Pierre	Reinecker, M.	971
Dirceu Herdies	A. da Silva	910
Artemio Plana Fattori	Y. Kaufman	913

The subsequent positions that these individuals went to are as follows: (P. G.) CETP (Centre d'etude des Environnement Terrestre et Planetaire) located in Velizy, (D.H.) Private Industry-non NASA related; A.P. (Institute for Astronomy and Geophysics, University of São Paolo, Brazil).

At the end of the reporting period, GEST had approximately 87 research staff on board.

Submitted or Published Papers by GEST Researchers during this Reporting Period

The articles submitted or published during this reporting period are listed in the Appendix T-2 at the end this section of the report.

GEST Related Seminars for this Reporting Period

Several GEST related seminars are listed in Appendix T-3 at the end of this section of the report.

Proposals submitted and funded by GEST Researchers During this Reporting Period

Proposals submitted by UMBC GEST research faculty are listed in Appendix T-4 at the end of this section of the report.

Appendix T-1. GEST Administrative Staff

GEST Administrative Staff as of December 31, 2001

Name	Position	Location	Telephone
Robert J. Curran	Director	UMBC/GSFC	410-455-8813 301-286-8951
L. Anathea Brooks	Assistant Director	UMBC/GSFC	410-455-8814 301-286-4226
Henry H. Plotkin	Chief Scientist	GSFC	301-286-7992
Debbie Hicks	Business Manager	UMBC	410-455-8815
Grace Roscoe	Executive Assistant	UMBC	410-455-8808
Nancy Flowers	Administrative Assistant II	UMBC	410-455-8899
Frances Lilly	Visitor/School Coordinator	GSFC	301-286-4099
Tom Low	Caelum Lead	Caelum	301-424-8205 x 349
Denise Everhart	Student Support	GSFC	301-286-4099

Locations:

UMBC
UMBC Technology Center, South Campus
1450 S. Rolling Road, Suite 3.002
Baltimore, MD 21227

GSFC
NASA Goddard Space Flight Center
Mail Code 900.1
Bldg, 28, Room W223
Greenbelt, MD 20771

Appendix T-2.
Publications - October 1, 2001 – December 31, 2001

Refereed

Julio Bacmeister

Eckermann, S. D., P. Preusse, B. Schaeler, J. Oberheide, D. Offermann, **J. T. Bacmeister** and D. Broutman, Global gravity wave "weather" in the middle atmosphere: preliminary insights from the CRISTA-SPAS missions, Proceedings of the Solar Terrestrial and Space Physics Community, 13th. National Congress of the Australian Institute of Physics, ANARE Research Reports, Australian Antarctic Division, Kingston, Tasmania, R. J. Morris and P. J. Wilkinson eds., 146, 11-24, 2001.

Tom Eck

Eck, T.F., B.N. Holben, O. Dubovik, A. Smirnov, I. Slutsker, J.M. Lobert, and V. Ramanathan, *Column integrated aerosol optical properties over the Maldives during the NE Monsoon for 1998-2000,* J. Geophys. Res., 106, 28555-28566, Nov. 27, 2001

Rosana Ferreira

Nieto Ferreira, R., T. M. Rickenbach, D. Herdies, and L. M. V. Carvalho: South American convection organization and circulation patterns during JFM 1998 and JFM 1999. Submitted to the Monthly Weather Review.

Herdies, D. H., A. Silva, M. A. F. Silva Dias, and R. **Nieto Ferreira**: The moisture budget of the bimodal pattern of the Summer circulation over South America. J. Geophys. Res. In press.

Rickenbach, T. M., R. **Nieto Ferreira**, J. Halverson, D. Herdies, and M. A. F. Silva Dias, 2001: Modulation of convection in the Southwestern Amazon Basin by extratropical stationary fronts. J. Geophys. Res. In press.

Charles Gatebe

Gatebe, C. K., P. D. Tyson, H. J. Annegarn, G. Helas, A. M. Kinyua and S. Piketh, Characterization and transport of aerosols over equatorial eastern Africa, Global Biogeochemical Cycles 15 (3), 663-672, 2001.

Nickolay Krotkov

Vasilkov,A.P., **N.A. Krotkov**, Jay Herman, Charles McClain, Kevin Arrigo, and Wayne Robinson, Global mapping of underwater UV irradiances and DNA-weighted exposures using TOMS and SeaWiFS data products, J. Geophys. Res.-Oceans, 106, C11, 27205-27219, 2001.

Krotkov, N.A. J.R.Herman, P.K.Bhartia V.Fioletov and Z.Ahmad, Satellite estimation of spectral surface UV irradiance 2. Effects of homogeneous clouds and snow, J. Geophys. Res. 106, 11743-11759, 2001.

Sarith Mahanama

Guillevic, P.C., R. D. Koster, M. J. Suarez, L. Bounoua, G. J. Collatz, S. O. Los and **S. P. P. Mahanama**, Influence of the interannual variability of vegetation on hydrologicalprocesses over land surfaces, submitted to J. Hydrometeorology, 2001.

Jayawardena A.W., and **S.P.P. Mahanama**: Daily river discharge prediction using GCM generated atmospheric data. In 'Soil-Vegetation-Atmosphere Transfer Schemes and Large-Scale Hydrological Models', edited by Dolman, H., Pomeroy, J., Oki, T., and Hall., A., **IAHS 270**, pp 159-165, 2001.

Rolf Reichle

Reichle, R. H., J. P. Walker, R. D. Koster and P. R. Houser, "Extended vs. Ensemble Kalman Filtering for Land Data Assimilation", submitted to the Journal of Hydrometeorology, 2001c.

Reichle, R. H., D. Entekhabi, and D. B. McLaughlin, "Downscaling of radio brightness measurements for soil moisture estimation: A four-dimensional variational data assimilation approach", Water Resources Research, 37 (9), 2353-2364, 2001b.

Reichle, R. H., D. B. McLaughlin, and D. Entekhabi, "Variational data assimilation of microwave radio brightness observations for land surface hydrology applications", IEEE Transactions on Geosciences and Remote Sensing, 39 (8), 1708-1718, 2001a.

Joan Rosenfield

Rosenfield, J. E., and M. R. Schoeberl, On the origin of polar vortex air, J. Geophys. Res. 106, 33,485-33,497, 2001.

Considine, D. B., **J. E. Rosenfield**, and E. Fleming, An interactive model study of the influence of the Mount Pinatubo aerosol on stratospheric and water trends, J. Geophys. Res., 106, 27,711-27,727, 2001.

Newman, P. A., E. R. Nash, and **J. E. Rosenfield**, What controls the temperature of the Arctic stratosphere during the spring, J. Geophys. Res..106, 19,999-20,010, 2001.

Rosenfield, J. E., A. R. Douglass, and D. B. Considine, The impact of increasing carbon dioxide on ozone recovery, J. Geophys. Res., in press.

Adam Schlosser

C. Adam Schlosser, Paul A. Dirmeyer, 2001: Potential predictability of Eurasian snow cover. Atmospheric Science Letters, 1, doi:10.1006/asle.2001.0037, http://www.academicpress.com/asl.

Reale, O., P. A. Dirmeyer, and **C. A. Schlosser**, 2001: Modeling the effect of land-surface variability on precipitation variability. Part II: spatial and time-scale structure. J. Hydromet. (in press).

Alexander Smirnoff

Eck, T.F., B.N.Holben, O.Dubovik, **A. Smirnov**, I.Slutsker, J.M.Lobert, and V.Ramanathan, Column integrated aerosol optical properties over the Maldives during the NE monsoon for 1998-2000, *J.Geophys.Res., 106*, 28555-28566, 2001.

Kaufman, Y.J., **A. Smirnov**, B.N.Holben, and O.Dubovik, Baseline maritime aerosol: methodology to derive the optical thickness and scattering properties, *Geoph.Res.Lett., 28*, 3251-3254, 2001.

Tanre, D., Y.J.Kaufman, B.N.Holben, B.Chatenet, A.Karnieli, F.Lavenu, L.Blarel, O.Dubovik, L.A.Remer, and **A. Smirnov**, Climatology of dust aerosol size distribution and optical properties derived from remotely sensed data in the solar spectrum, *J. Geoph. Res., 106*, 18,205-18,218, 2001.

Augustin Vintzileos

Codron F, **Vintzileos A**, Sadourny R (2001): Influence of mean state changes on the structure of ENSO in a tropical coupled GCM. Journal of Climate. 14, 730-742.

M. Latif, K. Sperber, J. Arblaster, P. Braconnot, D. Chen, A. Colman, U. Cubasch, M. Davey, P. Delecluse, D. DeWitt,*, L. Fairhead, G. Flato, T. Hogan, M. Ji, M. Kimotol, A. Kitoh, T. Knutson, H. Le Treut, T. Li, S. Manabe, O. Marti, C. Mechoso, G. Meehl, S. Power, E. Roeckner, J. Sirven, L. Terray, **A. Vintzileos**, R. Vo, B. Wang, W. Washington, I. Yoshikawa, J. Yu, and S. Zebiak, (2001) ENSIP: The El Nino simulation intercomparison project. Climate Dynamics, 18, 255-276.

Cara Wilson

Wilson, C. and D. Adamec. *Correlations between Surface Chlorophyll and Sea-Surface Height in the Tropical Pacific during the 1997/1998 ENSO Event.* Journal of Geophysical Research, 106, 31,175-31,188.

Non-Refereed

Adam Schlosser

Schlosser, C. A. and P. C. D. Milly, 2001: A model-based investigation of soil-moisture predictability and associated climate predictability. COLA Tech. Rep. # 106, 51 pp.

Reale, O., P. A. Dirmeyer, and C. A. Schlosser, 2001: Modeling the effect of land-surface variability on precipitation variability. Part II: spatial and time-scale structure. COLA Tech. Rep. #97, 39 pp.

Cara Wilson

Wilson, C. and D. Adamec, Indian Ocean Rossby waves and their effect on sea surface chlorophyll, to be submitted.

Appendix T-3. SEMINARS, October 1, 2001 – December 31, 2001

Tom Eck

Eck T .F., B. N. Holben, D. E Ward, M. M. Mukelabai, **O. Dubovik**, **A. Smirnov**, J. S. Schafer, **N. C. Hsu**, S. J. Piketh, A. Queface, J. Le Roux, I. Slutsker, Characterization of Biomass Burning Aerosol Optical Properties During the SAFARI 2000 Dry Season Campaign with AERONET Observations, AGU Fall Meeting, San Francisco, Dec 10-15, 2001.

Charles Gatebe

Gatebe, C. K., M. D. King, G. T. Arnold, and J. Y. Li, Airborne Spectral Measurements of Surface Atmosphere Anisotropy for Several Surfaces and Ecosystem over Southern Africa, Eos. Trans. AGU, 82(47), Fall Meet. Suppl., Abstract A51A-0018, 2001. Fall AGU 2001.

Abdou, W. A., M. C. Helmlinger, D. J. Diner, J. E. Conel, S. H. Pilorz, J. V. Martonchik, R. A. Kahn, J. L. Privette, **C. K. Gatebe** and M. D. King, Sua Pan Bidirectional Reflectance: A validation Experiment of the Multi-angle Imaging SpectroRadiometer (MISR) during SAFARI 2000, Eos. Trans. AGU, 82 (47), Fall Meet. Suppl., Abstract A41C-03, 2001.

Conel, J. E., W. A. Abdou, S. H. Pilorz, D. J. Diner, J. L. Privette, **C. K. Gatebe**, B. L. Holben, T. Eck, and M. D. King, Intercomparison of AirMISR, CAR, and MISR Observations of Bidirectional Reflectance Factor, Mongu Tower, Zambia, during SAFARI 2000 Dry Season Campaign, Eos. Trans. AGU, 82 (47), Fall Meet. Suppl., Abstract A51A-0033, 2001.

Smith, W. L., T. Charlock, B. Wielicki, R. Kahn, J. Martins, L. Remer, **C. K. Gatebe**, P. V. Hobbs, G. Purgold, J. Redemann, and K. Rutledge, The Chesapeake Lighthouse and Aircraft Measurements for Satellite (CLAMS) Campaign: Experiment Overview, Eos. Trans. AGU, 82(47), Fall Meet. Suppl., Abstract A41B-0076, 2001.

Smith, W. L., T. Charlock, B. Wielicki, R. Kahn, J. Martins, L. Remer, **C. K. Gatebe**, P. V. Hobbs, J. Redemann, Lorraine Remer and K. Rutledge, The Chesapeake Lighthouse and Aircraft Measurements for Satellite (CLAMS) Campaign: Experiment Overview, 11th Satellite Meteorology and Oceanography conference, Oct 15-18, Madison, Wisconsin.

Nickolay Krotkov

1) Presentation at the TOMS/OMI Science Team Meeting, GSFC, November 2001
2) Presentation at the OMI STM/TLCF meeting, SSAI, December 2001.

Jerome Riedi

J. C. Riedi - - - PhD Thesis : "A study of cloud thermodynamic phase from global scale polarization measurements: Application to the POLDER1-ADEOS1 space mission." Defended on October 9th 2001at Univeristy of Lille France. 220pp. Available from the author or University of Lille I library.

Adam Schlosser

Schlosser, C. A., P. Morel, P. Houser, B. Schiffer, and R. Bras: NASA Global Water and Energy Cycle Research, presented as the NASA agency review of water-cycle research at the Committee on Hydrological Science (COHS) of the National Research Council (NRC) meeting, October 9, 2001.

Houser P., **C. A. Schlosser**, P. Morel, B. Schiffer, and R. Bras: NASA Global Water and Energy Cycle Research, Goddard Congressional Staff Briefing, Goddard Space Flight Center, Greenbelt, MD, December 17, 2001.

R. Bras, **C. A. Schlosser**, P. Morel, P. Houser, and B. Schiffer: The NASA Water and Energy-cycle Research (WatER) initiative, presented as the plenary presentation for the NASA Global Water and Energy Cycle Town-Hall Meeting, American Geophysical Union Meeting, San Francisco, CA, December 15, 2001.

Schlosser, C. A. and P. A. Dirmeyer: The impact of realistic land conditions in dynamical seasonal predictions. Extended abstract volume of the 16th Conference on Hydrology, 82nd AmericanMeteorological Society Meeting, Orlando, FL.

Schlosser, C. A. and B. Kirtman: Predictable skill and its associated sea-surface temperature variability in an ensemble climate simulation. Extended abstract volume of the 13th Symposium on Global Change and Climate Variations, 82nd American Meteorological Society Meeting, Orlando, FL.

Chung-Lin Shie

Shie, C.-L., W.-K. Tao, J. Simpson, and C.-H. Sui, Quasi-equilibrium states in the Tropics simulated by a cloud-resolving model. Part 1: Specific features and budget analysis (in revision, submitted to *J. of Climate*).

Alexander Smirnoff

Holben, B.N., T.F.Eck, D.E.Ward, M.M.Mukelabai, O.Dubovik, **A. Smirnov**, J.S.Schafer, N.C.Hsu, S.J.Piketh, A.Queface, J.Le Roux, and I.Slutsker, Characterization of biomass burning aerosol optical properties during SAFARI 2000 with AERONET observations, SAFARI Special session, AGU Fall Meeting, San-Francisco, CA, December 10-15, 2001.

Smirnov, A., B.N.Holben, R.Frouin, G.Fargion, O.Dubovik, T.F.Eck, and I.Slutsker, Maritime aerosol optical model based on the Aerosol Robotic Network (AERONET) measurements, AGU Fall Meeting, San-Francisco, CA, December 10-15, 2001.

Smirnov, A., B.N.Holben, Y.J.Kaufman, O.Dubovik, T.F.Eck, and I.Slutsker, Atmospheric aerosol optical properties in maritime environments, AeroCenter Seminar, Goddard Space Flight Center, Greenbelt, MD, November 14, 2001.

Holben, B.N., **A.Smirnov**, T.Eck, O.Dubovik, and I.Slutsker, AERONET - a globally distributed ground-based aerosol optical properties measurement program, Symposium on Global Aerosol Climatology Database Preliminary Program, Portland, Oregon, October 13-14, 2001.

Alberto Troccoli

Troccoli, A. and Rienecker, M.M., The importance of salinity in the assimilation of temperature observations in the tropical Pacific Ocean, Proceedings of 26th Climate Diagnostics and Prediction Workshop, 2001.

Augustin Vintzileos

26th Climate Diagnostic and Prediction Workshop. La Jolla, California October 22 - October 26, 2001, Poster presentation.

Wilson, C. and D. Adamec. The role of physical forcing on the seasonal chlorophyll cycle in the Indian Ocean. NASA Physical Oceanography Conference, Miami, FL, April, 2001.

Appendix T-4.
Proposals Funded - October 1 , 2001 – December 31, 2001

P.I.	**Christina Hulbe – funded**
Title:	Discharge Variability of Ross Ice Storms Over the Last Millennium"
Sponsoring Agency:	National Science Foundation
Budget/Commitment	$13,475

P.I.	**Judit Pap – funded**
Title:	"Study of Solar and Spectral Gradiance Variations Based on SOHO/VIRGO and MDI"
Sponsoring Agency:	National Science Foundation
Budget/Commitment	$136,748

P.I.	**S. Sakimoto - funded**
Title:	" Mars Water Constraints from Impact Cratering and Volcanism"
Sponsoring Agency:	NASA
Budget/Commitment	$13,000

Business Status Report

Amendments Received During this Reporting Period

Three amendments to the Cooperative Agreement were received during the present reporting period. At the start of the reporting period a total of $9,744,006 was obligated to the Cooperative Agreement. As of 12/30/01 the total financial obligation was $10,770,214. Table B.1 gives an over view of these amendments.

Table B.1. Amendments to NCC5-494, received between 10/1/01 and 12/31/01.

Amendment Number	Date	Amount	Activities Added/Augmented	Activities Deleted
25	10/19/01	10,350,242	1	0
26	11/19/01	10,451,207	1	0
27	12/17/01	10,770,214	0	0

The attached Table B.2 gives a detailed breakdown of the new or augmented activities in amendments 25, 26 and 27.

Summary of Account Activity

The most recent cost analysis for GEST, giving actual costs accrued during the reporting period was dated 12/31/01. Table B.3 gives a detailed breakdown, by task number of the costs incurred, the approved budget and remaining balance, during the reporting period.

TABLE B-3. DETAILED COST BREAKDOWN FOR THE LAST THREE MONTHS OF THE REPORTING PERIOD

GEST Monthly Cost Analysis - October 1, 2001 - December 31, 2001

GEST Task # and Sponsor	A Salary	C Fringe	T Travel	Subcontracts	U Supplies	A Publications	Contractual	L Equipment	ODC	Total Direct Costs	Indirect	Total Costs 10/1/01-12/31/01	Total Costs thru 9/30/01	Total Year to Date	Approved Budget 10/1/01-12/31/01	Projected Costs	Balance Remaining 12/31/2001
#931-00-001 Macie	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#971-00-002 Rienecker/Adamec	136,229	32,872	5,185	0	0	0	0	0	0	174,286	34,857	209,143	957,198	1,166,341	1,147,368	0	(18,973)
#931-00-003 Palm	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#930-00-004 Mitchell	0	0	0	0	0	0	0	0	0	0	0	0	56,494	56,494	56,494	0	0
#902-00-005 Olsen	31,462	6,180	3,283	0	0	0	0	0	0	40,925	8,185	49,110	258,545	307,655	302,000	0	(5,655)
#902-00-006 Olsen	31,385	5,566	0	0	0	0	0	0	0	36,951	7,390	44,341	240,696	285,037	474,148	0	189,111
#910-01-008 Hou/Rood	30,945	8,090	(14,890)	0	0	0	11	0	0	24,156	4,831	28,987	154,258	183,245	158,108	0	(25,137)
#910-01-009 Atlas/Hou	21,332	6,091	0	0	0	0	0	0	0	27,423	5,485	32,908	169,025	201,933	153,218	0	(48,715)
#910-01-010 Atlas	27,048	6,084	495	0	0	0	0	0	0	33,627	6,725	40,352	192,571	232,923	156,221	0	(76,702)
#912-01-011 Spinhirne	30,892	19,338	666	0	0	0	0	0	0	50,896	10,179	61,075	206,851	267,926	210,023	0	(57,903)
#912-01-012 Spinhirne	14,241	4,255	641	0	0	0	0	0	0	19,137	3,827	22,964	80,136	103,100	122,377	0	19,277
#910-01-014 Schoeberl	25,508	5,405	0	0	33	0	0	0	0	30,946	6,189	37,135	105,185	142,320	172,484	0	30,164
#916-01-016 Kawa	5,140	769	298	0	0	0	0	0	0	6,207	1,241	7,448	8,043	15,491	9,377	0	(6,115)
#916-01-017 Bhartia	42	0	5,535	0	0	0	0	0	0	5,577	873	6,450	14,778	21,228	12,639	0	(8,589)
#921-01-018 Frey	26,165	3,756	2,943	0	0	0	0	0	0	32,864	9,277	42,141	210,947	253,088	214,196	0	(38,892)
#923-01-019 Deering - CAELUM	204	0	5,438	0	0	0	0	0	65	5,642	1,282	6,924	16,642	23,566	25,000	0	1,434
#930-01-020 Fischer - CAELUM	23	0	616	0	0	0	0	0	0	639	128	767	767	1,534	15,000	0	13,466
#930-01-021 Fischer	0	0	0	0	0	0	0	0	0	0	0	0	17,277	17,277	62,723	0	45,446
#935-01-022 Dorband	19,890	4,692	0	0	0	0	28	0	27	24,610	4,927	29,537	155,567	185,104	176,644	0	(8,460)
#930-01-023 Fischer	26,619	6,324	0	0	0	0	0	0	0	32,943	6,589	39,532	216,290	255,822	190,000	0	(65,822)
#930-01-024 Fischer	0	0	0	0	0	0	0	0	0	0	0	0	3,718	3,718	9,000	0	5,282
#912-02-027 Heymsfield	14,790	2,535	2,490	0	0	0	0	0	0	19,815	3,963	23,778	97,802	121,580	99,000	0	(22,580)
#912-02-029 Tao	15,785	5,140	0	0	0	0	0	0	0	20,925	4,185	25,110	113,206	138,316	133,100	0	(5,216)
#912-02-034 Tao/Negri	0	0	0	0	0	0	0	0	0	0	0	0	49,019	49,019	49,020	0	1
#913-02-035 Chao	13,101	3,411	0	0	0	0	0	0	0	16,512	3,302	19,814	84,300	104,114	71,935	0	(32,179)
#912-02-036 Starr	13,962	3,123	0	0	0	0	0	0	0	17,085	3,417	20,502	91,991	112,493	88,375	0	(24,118)
#913-02-037 Lau - CAELUM	0	0	0	0	0	0	0	0	0	0	0	0	5,620	5,620	10,000	0	4,380
#913-02-038 Kaufman - CAELUM	0	0	7,414	0	0	0	0	0	0	7,414	1,546	8,960	29,225	38,185	20,000	0	(18,185)
#971-02-040 Hakkinen	15,632	3,957	1,330	0	0	0	0	0	0	20,919	4,184	25,103	113,517	138,620	133,420	0	(5,200)
									0								
#900-03-041 King	15,522	3,773	591	0	0	0	0	0	0	19,886	3,977	23,863	112,153	136,016	110,000	0	(26,016)
#910-03-042 Cohn - CAELUM	0	0	6,496	0	0	0	0	0		6,496	1,954	8,450	17,487	25,937	40,000	0	14,063
#910-03-043 Richards - CAELUM	0	0	2,259	0	0	0	48	0	0	2,307	844	3,151	68,833	71,984	89,750	0	17,766
#910-03-047 Richards	22,666	28,929	0	0	0	0	1,216	0	0	52,811	10,572	63,383	63,383	126,766	180,908	0	54,142
#912-03-064 Negri - CAELUM	0	0	698	0	0	0	0	2,500	0	3,198	640	3,838	8,665	12,503	6,139	0	(6,364)
#913-03-065 Lau	0	0	0	0	0	0	0	0	0	0	0	0	36,227	36,227	36,227	0	0
#913-03-066 Lau	0	0	0	0	0	0	0	0	0	0	0	0	41,698	41,698	41,898	0	200
#923-03-067 Holben	62,456	16,342	1,637	0	0	0	0	0	0	80,435	16,087	96,522	222,421	318,943	170,000	0	(148,943)
#930-03-068 Halem	22,584	3,277	945	0	0	296	0	0	0	27,102	5,420	32,522	197,497	230,019	242,820	0	12,801
#935-03-069 Coronado/Shamann	4,320	0	0	0	0	0	0	0	0	4,320	2,514	6,834	151,800	158,634	142,111	0	(16,523)
#974-03-070 Houser	124,161	29,660	3,745	0	0	32	0	0	0	157,598	31,911	189,509	706,167	895,676	1,027,634	0	131,958
#693-04-073 Reuter	0	0	50	0	0	0	0	0	0	50	10	60	19,793	19,853	20,802	0	949
#910-04-074 Rood	20,348	3,588	28	0	0	0	0	0	0	23,964	6,694	30,658	186,844	217,502	178,000	0	(39,502)
#916-04-076 Herman/Krueger	20,139	5,888	6	0	0	0	0	0	0	26,033	5,207	31,240	144,161	175,401	143,212	0	(32,189)
#930-04-077 Halem	0	0	0	0	0	0	0	0	0	0	0	0	28,351	28,351	28,351	0	(1)
#586-05-081 Behnke	5,245	0	350	0	0	0	0	0	0	5,595	1,119	6,714	69,336	76,050	100,000	0	23,950
#910-05-082 Rood	12,887	2,769	0	0	0	0	0	0	0	15,656	3,131	18,787	68,167	86,954	101,000	0	14,046
#130-05-083 Gabrys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(14,656)	0	(14,656)
#550-05-084 Lyon	0	0	0	0	0	0	0	0	0	0	0	0	54,281	54,281	113,300	0	59,019
#130-05-085 Gabrys	23,653	6,235	2,939	0	0	0	53	0	0	32,880	6,576	39,456	184,897	224,353	189,045	0	(35,308)
#974-05-086 Chang	17,543	4,138	1,624	0	0	0	0	0	23	23,305	4,666	27,971	115,376	143,347	184,582	0	41,235

TABLE B-3. DETAILED COST BREAKDOWN FOR THE LAST THREE MONTHS OF THE REPORTING PERIOD

GEST Monthly Cost Analysis - October 1, 2001 - December 31, 2001

GEST Task # and Sponsor	A Salary	C Fringe	T Travel	Subcontracts	U Supplies	A Publications	Contractual	L Equipment	ODC	Total Direct Costs	Indirect	Total Costs 10/1/01-12/31/01	Total Costs thru 9/30/01	Total Year to Date	Approved Budget 10/1/01-12/31/01	Projected Costs	Balance Remaining 12/31/2001
#550-06-087 Lyon	18,095	5,540	0	0	3,020	0	0	0	0	26,655	5,331	31,986	145,810	177,796	143,003	0	(34,793)
#912-06-088 Spinhirne	14,601	3,471	0	0	0	0	0	0	0	18,072	3,614	21,686	104,542	126,228	150,418	0	24,189
#910-06-091 Schoeberl	0	0	0	0	0	0	0	0	0	0	0	0	22,408	22,408	22,408	0	0
#923-06-092 Tucker	16,073	3,653	2,013	0	0	0	0	0	0	21,739	4,348	26,087	107,728	133,815	157,429	0	23,614
#935-06-094 Le Moigne	0	0	0	0	0	0	0	0	0	0	0	0	7,092	7,092	10,000	0	2,908
#926-07-096 Chao - CAELUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33,337	0	33,337
#681-08-097 Bowers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	(35,000)	0	(35,000)
#910-08-098 Hou	0	0	652	0	0	0	11	0	0	663	3,621	4,284	8,877	13,161	0	0	(13,161)
#910-08-099 Atlas	32,634	9,594	-1,485	0	0	0	0	0	0	40,743	8,149	48,892	175,843	224,735	127,452	0	(97,283)
#910-08-100 da Silva	9,553	2,613	1,338	0	85	0	0	0	0	13,589	2,718	16,307	49,510	65,817	46,104	0	(19,713)
#916-08-101 Herman	13,260	3,018	874	0	0	0	0	0	0	17,152	3,495	20,647	72,226	92,873	123,240	0	30,367
#930-08-102 Gabrys	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,267	0	10,267
#902-09-103 Olsen	23,037	3,676	2,076	0	0	0	0	0	0	28,789	5,758	34,547	205,090	239,637	214,600	0	(25,037)
#970-09-104 Ormsby - CAELUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,392	0	4,392
#970-09-105 Ormsby - CAELUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,000	0	1,000
#971-09-106 Bindschadler	0	0	0	0	0	0	0	0	0	0	0	0	31,659	31,659	35,800	0	4,141
#971-10-107 Liu	0	0	0	0	0	0	0	0	0	0	0	0	1,107	1,107	10,000	0	8,893
#912-10-108 Spinhirne	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
#912-10-109 Tao	15,841	5,145	0	0	0	0	0	0	0	20,986	4,197	25,183	65,878	91,061	65,309	0	(25,752)
#931-10-110 Zlesak/Fischer	6,277	0	527	0	0	0	0	0	813	7,617	3,829	11,446	67,580	79,026	83,221	0	4,195
#931-10-111 Lawrence	193	0	4,020	0	0	0	0	0	198	4,213	869	5,082	15,251	20,333	80,000	0	59,667
#903-11-112 Reising	3,781	0	2,841	0	0	0	0	0	606	7,228	2,686	9,914	103,153	113,067	124,657	0	11,590
#935-11-113 LeMoigne	5,928	457	0	0	0	0	0	0	0	6,385	1,277	7,662	26,794	34,456	25,000	0	(9,456)
#930-11-114 Mack/Halem	7,925	0	585	0	0	0	0	0	52	8,562	4,696	13,258	161,815	175,073	149,060	0	(26,013)
#930-12-115 Spicer	21,480	4,717	2,128	0	0	0	0	0	0	28,325	5,665	33,990	89,187	123,177	97,277	0	(25,900)
#912-10-116 Tao	18,123	4,721	0	0	33	0	0	0	0	22,877	4,575	27,452	71,448	98,900	109,298	0	10,398
#913-12-117 Lau	13,608	4,257	1,183	0	0	0	0	0	0	19,048	3,810	22,858	70,012	92,870	108,968	0	16,098
#913-12-118 Wiscombe	7,672	2,139	1,891	0	0	0	0	0	0	11,702	2,340	14,042	89,126	103,168	85,000	0	82,660
#972-13-119 Vandemark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,200	0	13,200
#913-13-120 Tsay	19,130	4,704	6,284	0	0	0	0	0	0	30,118	6,024	36,142	73,973	110,115	47,750	0	(62,365)
#916-13-121 Gleason	17,184	3,980	0	0	0	0	0	0	0	21,164	4,233	25,397	72,166	97,563	78,700	0	(18,863)
#423-14-122 Behnke	14,925	0	0	0	0	0	0	0	0	14,925	8,686	23,611	45,063	68,674	50,000	0	(18,674)
#910-14-123 Schubert	20,137	4,874	150	0	0	0	0	0	0	25,161	5,032	30,193	30,193	60,386	55,430	0	(4,956)
#910-14-124 Hou	17,184	4,188	1,485	0	0	0	0	0	0	22,857	4,571	27,428	47,175	74,603	0	0	(74,603)
#910-14-125 Lin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	82,355	0	82,355
#975-14-126 Kim	5,824	0	0	0	52	0	0	0	0	5,876	1,175	7,051	9,102	16,153	12,500	0	(3,653)
#935-16-127 LeMoigne	4,500	0	132	0	0	0	0	0	0	4,632	912	5,544	7,758	13,302	16,000	0	2,698
#930-16-128 Degnan	20,681	0	0	0	0	0	0	0	0	20,681	4,136	24,817	34,002	58,819	40,000	0	(18,819)
#912-18-129 Braun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70,951	0	70,951
#913-18-130 Bell	17,184	2,947	0	0	0	0	0	0	0	20,131	0	20,131	24,124	44,255	17,097	0	(27,158)
#912-19-131 Heymsfield	12,657	3,199	3,478	0	0	0	0	0	0	19,334	3,867	23,201	23,201	46,402	46,716	0	314
#926-19-132 Chao, Ben	11,219	1,377	0	0	23	0	0	0	0	12,619	2,524	15,143	15,173	30,316	25,000	0	(5,316)
#915-19-133 Niemann	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100,000	0	100,000
#915-19-134 LeMoigne	12,562	2,930	158	0	0	0	0	0	0	15,650	3,252	18,902	18,934	37,836	62,190	0	24,354
#910-19-135 Pawson	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43,606	0	43,606
#900-19-136 King	3,836	278	0	0	0	0	716	0	0	4,830	966	5,796	5,796	11,592	25,000	0	13,408
#971-20-137 Koblinsky	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,500	0	2,500
#910-20-138 DaSilva	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94,414	0	94,414
#912-21-140 Adler	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115,755	0	115,755
#900-21-141 Meeson	23	0	1,078	0	0	0	0	0	0	1,101	216	1,317	1,317	2,634	24,765	0	22,131
#924-21-142 Whiteman	0	0	257	0	0	0	0	0	0	257	51	308	308	616	39,356	0	38,740

TABLE B-3. DETAILED COST BREAKDOWN FOR THE LAST THREE MONTHS OF THE REPORTING PERIOD

GEST Monthly Cost Analysis - October 1, 2001 - December 31, 2001

GEST Task # and Sponsor	A Salary	C Fringe	T Travel	Subcontracts	U Supplies	A Publications	Contractual	L Equipment	ODC	Total Direct Costs	Indirect	Total Costs 10/1/01-12/31/01	Total Costs thru 9/30/01	Total Year to Date	Approved Budget 10/1/01-12/31/01	Projected Costs	Balance Remaining 12/31/2001
#972-21-143 Gerlach	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112,000	0	112,000
#916-21-144 Chandra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,000	0	8,000
#912-21-145 Adler	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56,697	0	56,697
#913-21-146 Calahan	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	0	50,000
#912-23-147 Smith, E.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40,000	0	40,000
#920-25-148 Carter, D.	21	5	0	0	0	0	0	0	0	26	12	38	38	76	5,000	0	4,924
#971-26-149 Hakkinen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50,000	0	50,000
Totals	1,257,067	313,670	74,477	0	3,246	328	2,083	2,500	1,784	1,654,842	350,541	2,005,383	8,247,666	10,253,049	10,770,214	0	617,993